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(54) **HYBRID CYCLE FOR THE PRODUCTION OF LIQUEFIED NATURAL GAS**

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(57) **ABSTRACT**

Refrigeration process for gas liquefaction which utilizes one or more vaporizing refrigerant cycles to provide refrigeration below about -40° C. and a gas expander cycle to provide refrigeration below about -100° C. Each of these two types of refrigerant systems is utilized in an optimum temperature range which maximizes the efficiency of the particular system. A significant fraction of the total refrigeration power required to liquefy the feed gas (typically more than 5% and often more than 10% of the total) can be consumed by the vaporizing refrigerant cycles. The invention can be implemented in the design of a new liquefaction plant or can be utilized as a retrofit or expansion of an existing plant by adding gas expander refrigeration circuit to the existing plant refrigeration system.

26 Claims, 9 Drawing Sheets

